The Port of Bellingham

Planning for Sea Level Rise

Mike Hogan: ***Port of Bellingham***

November 1, 2012

Bellingham Bay

Projected Sea Level Rise

- University of Washington Climate Impacts Group
- Intergovernmental Panel on Climate Change (2007)

  - Next Update Oct. 2014

Best Estimate: 2.3 Feet over 100 years

Bellingham Bay

Sea Level Rise Impacts

- Extreme Storm Events
- Flooding
- Inundation

- Erosion
- Changes to Setbacks & Buffers

Major Strain on Waterfront Infrastructure

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Waterfront Operations & Activities

- Marinas & Marine Terminals
- Manage Waterfront Property for Industrial, Commercial & Recreational Uses
- Environmental Cleanup
- Habitat Restoration

Ground Zero for Projected Sea Level Rise

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Planning for Sea Level Rise

- Identify At-Risk Areas
- Select Mitigation Strategy Based on Infrastructure Value, Expected Life-Span & Adaptive Capacity
- Monitor Best Available Science

Range of Strategies for Sea Level Rise

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Waterfront Redevelopment Project

- GP Closes - Port Acquires Property in 2005
- 220 Acre Mixed Use Redevelopment
- 3 Miles of Shoreline
- 6 Cleanup Sites (>$100 Mil)
- Major Investment in Public Infrastructure

Sea Level Rise Considered as Part of SEPA

Bellingham's Waterfront Today

Community Design Objectives

- Climate Change / Sea Level Rise
- Long-Term Planning
- Environmental Remediation
- Seismic Conditions
- Engineering Feasibility
- Shoreline Restoration
- Historic & Cultural Resources
- Community Connections
- Complete Streets
- Small Block Size
- View Corridors
- Western Washington University
- Economic Viability
- LEED Neighborhood Concepts
- Strategic Partnerships

Bellingham's Waterfront Tomorrow

Stephanie Bower, Architectural Illustration

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High Value Infrastructure

- 100+ Year Design Life
- Raise Site Grades 2-4 Feet to Protect Investment

Design Accommodates Sea Level Rise

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Marine Industrial Infrastructure

- Shorter Design Life & Lower Value
- Adaptive Management Avoids Unnecessary Costs & Resource Use
- Periodic Maintenance Required

Well Suited for Adaptive Management

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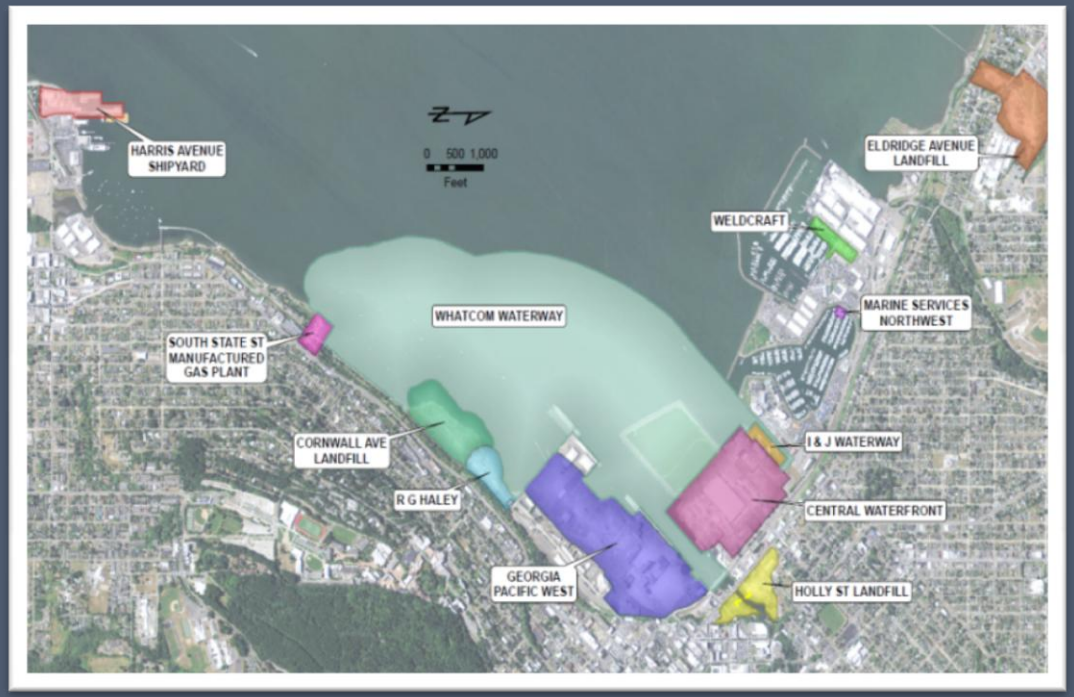
Environmental Cleanup



- 12 Complex Sites in Bellingham Bay
- Over $150 Million in Cleanup Costs
- Analyze Potential Impacts Sea Level Rise on Site by Site Basis & Address through Engineering Design

Protecting Human Health & the Environment

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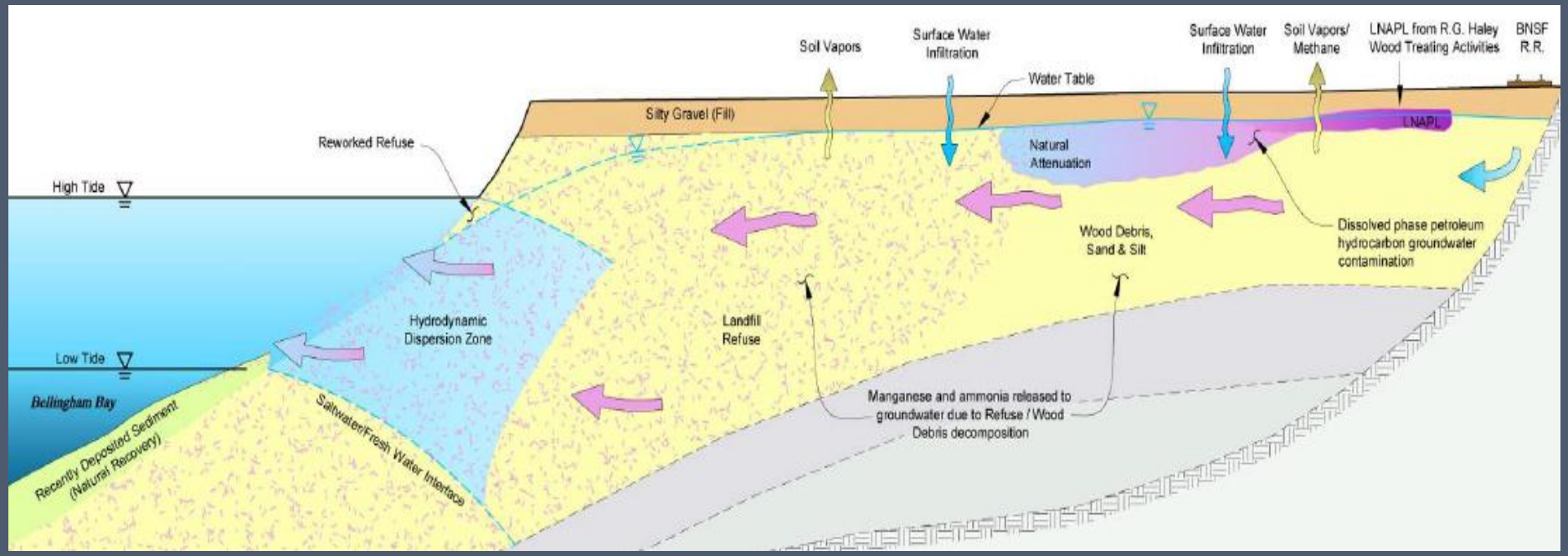
Cornwall Avenue Landfill



- **Analyze Potential for Sea Level Rise to Raise Ground Water Table into Contaminants & Become New Source to Bellingham Bay**

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Whatcom Waterway Cleanup

- **$30 Million Project (Fall 2013)**
- **Design Anticipates Storm Surges**
- **3 Ft. Underwater Cap Protects against Erosion & other Disturbances**
- **Shorelines Armored w/ Stone**
- **Caps and Bulkhead Stabilization consider Planned Changes in Upland Elevations to Accommodate Potential Sea Level Rise**
- **Long-Term Monitoring**

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Habitat Restoration & Sea Level Rise

- Design Flexible Shoreline Environment, Try Not to Fight Nature with a “Line of Defense”
- Use Naturalized Shorelines to Absorb Wave Energy
- Build Adaptive Management into O & M

Marine Park Shoreline Restoration


HITACHI
United Rentals
14 3:03 PM

- People Friendly & Salmon Friendly Shorelines

Port of Bellingham

Reducing Greenhouse Gas Emissions

- Energy Audit & Energy Efficiency Upgrades
- Renewable Energy R&D
- Green Building Practices
- LEED Neighborhood Design Principles
- Shore Power for Maritime Operations
- Hybrid Fleet Replacement

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LEED GOLD